

Collaborative studies are to be undertaken within the major biotic areas in both terrestrial and aquatic environments. Coordinated research will be conducted in entire drainage basins, where environments will be studied simultaneously. Aquatic and terrestrial components of ecosystems must be studied together because they have strong interactions. The program seeks particularly to achieve its objectives through the catalysis of new techniques.

At least three steps lead toward this broad objective:

1. We want to encourage the development of a theory of ecosystems from small-scale laboratory and field studies. The elements of such a theory already exist but require reassessment, refinement, and expansion.
2. Since large-scale natural systems are composed of interacting subsystems, there are problems of scale and of organization which must be solved. Tentative solution of these problems can be tested and further improved only by integrating the ideas inherently concerned with this additional level of complexity with well-organized efforts.
3. To whatever degree this integration proceeds, it will provide perspective for the already extensive experience in landscape management. It may lead to alterations possibilities for management. The results should help man to judge policies for natural resources and ecological zoning to serve diverse human needs.

International efforts to hasten this procedure:

1. Exchange of information at two levels—research design and data analysis.
2. Exchange of mature scientists between laboratories interested in IBP programs.
3. Training in specialized techniques of production biology for IBP programs and related sciences.

PROGRAM

Intensive Drainage Basin Studies

The study of drainage basins as ecosystems offers possibilities for integrated research which have been neglected or viewed too narrowly, despite their relevance to man's use of his environment. We recommend, therefore, that much of the effort of the Subcommittees on Terrestrial and Freshwater Productivity be focused on intensive, multidisciplinary analyses of ecosystems. Study areas will be selected in which the interrelationships of terrestrial and aquatic communities can be investigated. The site should include both undisturbed communities and communities highly modified by human use.

We recommend that concentrated efforts be made in a limited number of sites, representing the following ecosystems: deciduous forests, coniferous forests, grasslands, deserts, tropical forests, and arctic tundra. Scientists with a wide range of interests should collaborate in these centers for intensive study. In addition, contributions can be made through more limited investigations on related communities at other locations. Each study site would be located where there is already a strong university or Federal laboratory.

Limited ecosystem studies are already in progress at a number of locations including several in the eastern deciduous and western coniferous forest in the southwestern desert and in the Arctic. Hydrologic data and other basic information have been gathered at a number of other locations. Any area considered particularly appropriate for comprehensive ecosystem study, either by virtue of the landscape and biological components or by the nature of the background studies completed or in progress there, should be brought to the attention of the Chairman of the PT or PF subcommittees.

Final site selection should be made by a task force composed of at least the following persons: (a) the project coordinator(s), (b) an animal ecologist, (c) a plant ecologist, (d) a limnologist, (e) a geologist, (f) a hydrologist, and (g) a meteorologist. The task force will consider potential cooperation of research centers, training centers, and information centers and non-U.S. collaborators, in addition to considering the inherent ecological interest and management problems of available areas.

CONTRIBUTING STUDIES

The need for understanding of ecosystems is such that any ecological study addressed to IBP objectives is encouraged. Two types of studies are complementary to the intensive investigations under IBP sponsorship at selected loca-